APP
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Docket 90077MGB
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Christopher J. Edge, et al

COLOR IMAGE DISPLAY ACCURACY USING GREEN-LOCKED GRAY BALANCE ESTIMATE

Serial No. 09/778,704

Filed February 07, 2001

Group Art Unit: 2672

Examiner: Javid A. Amini

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Gina Marie Schmitt

August 25, 2006
Date

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir:

APPEAL BRIEF TRANSMITTAL

Enclosed herewith is Appellants' Appeal Brief for the above-identified application.

The Commissioner is hereby authorized to charge the Appeal Brief filing fee to Eastman Kodak Company Deposit Account 05-0225. A duplicate copy of this letter is enclosed.

Respectfully submitted,

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Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

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Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134

This is an Appeal from the final Office Action mailed on April 1, 2005, finally rejecting claims 1-7, 11-21, 24-34, and 37-42. The Notice of Appeal was timely filed on June 29, 2005.

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REAL PARTY IN INTEREST

The Real Party in Interest is Eastman Kodak Company, of Rochester, New York.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

STATUS OF CLAIMS

Claims 1-7, 11-21, 24-34, and 37-42 are pending and are the subject of this Appeal. The claims are set forth in the Appendix.

Claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39 stand rejected under 35 U.S.C. 102(b) as being anticipated by Elaine Weinmann and Peter Lourekas, "Photoshop 3 for Windows (Visual QuickStart Guide)," 1996 ("Weinmann").

Claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe Technical Guides 1996 (Adobe).

Claims 14, 25 and 40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe, and further in view of "Why do Images Appear Darker on Some Displays? An Explanation of Monitor Gamma," by Robert Berger ("Berger"), and "Display gamma estimation applet," by Hans Brettel ("Brettel").

Claims 1, 5-7, 9, 11-13, 16-18, 22, 27, 29, 31-33, 35, 37, 38, 41 and 42 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6-8, 10, 12-16, 19, 21, 24, 25, 30, 31, 32, 34, 36, 37, 39 and 40 of copending U.S. application no. 09/778,515.

STATUS OF AMENDMENTS

No after-final amendments have been filed subsequent to the mailing of the final Office Action.

SUMMARY OF CLAIMED SUBJECT MATTER

The claimed inventions relate to remote color characterization of a display device. The availability of color characterization information for a remote display device permits a color image server to modify color values in images sent to the display device to promote color image display accuracy.[1] In particular, the color values are adjusted to compensate for display device differences, and thereby produce consistent color output.[2] The claimed inventions permit accurate color characterization to be performed remotely with a relatively small number of operations, offering enhanced efficiency.[3]

The claimed inventions may be applied to perform color characterization for display devices associated with potentially hundreds or thousands of remote Internet users. For example, a web-based retailer may use color characterization information to adjust color images for individual customers with different display devices, so that the customers view clothing items with accurate color, e.g., burgundy instead of red or brown.[4] Remote color characterization with enhanced efficiency is highly desirable in terms of reducing the number of "clicks" required by the individual users while also ensuring adequate color accuracy.[5]

For many Internet retailers, color accuracy in product images viewed by online customers can be a significant concern. In the case of clothing retailers, for example, a shirt viewed by an online customer should match its actual color as closely as possible.[6] Unfortunately, the color output characteristics of different display devices differ significantly. For example, the display devices used by individual online customers have different types, manufacturers, video cards

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[1] Page 3, lines 25-28.
[2] Id.
[3] Page 24, lines 12-24.
[4] Page 1, line 14, to Page 2, line 5; page 4, lines 24-28; page 10, lines 9-13, page 13, lines 16-21.
[5] Page 24, lines 12-24.
[6] Page 1, line 14, to Page 2, line 5; page 4, lines 24-28; page 10, lines 9-13, page 13, lines 16-21.

driver software, and operating systems, which contribute to rendering and presentation of red, green and blue (RGB) display output.[7] Aging, drift and display settings can introduce additional differences in display output.

The net result of the display differences is that users viewing the same image on different display devices do not see the same colors. The claimed inventions support remote color characterization of individual display devices. Using the color characterization, images sent to the individual display devices are corrected to compensate for output differences, ensuring that different customers view substantially the same color output.[8] In the case of Internet retailers, enhanced color accuracy may reduce the number of product returns due to color mismatch between the product viewed online and the product actually purchased by the customer.[9]

According to the claimed invention, remote color characterization is based on a green-locked gray balance estimate,[10] which will be explained in greater detail below. Gray balance refers to a difference in gamma values between the color channels, e.g., red, green and blue, of a display device.[11] Gamma refers to the relationship between input color values and the actual color output produced by a display device. In this sense, gamma represents the response of the display device to a range of input color values.[12]

In order to ensure accurate, consistent color output, it is necessary to (a) characterize the color response of the display device and correct input color values based on the characterization to compensate for differences in gamma among various display device, or (b) calibrate the gamma of each display device to a standard gamma value. In a network environment, it is more practical to correct the input color values associated with images sent to the display devices, rather than calibrate the gamma response for the display devices. To that end, the focus of the claimed inventions is color characterization of a display device to estimate

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[8] Page 3, lines 25-30; page 4, lines 16-21; page 14, lines 11-15.
[9] Page 4, lines 25-28.
[10] Page 2, lines 10-11.
[11] Page 2, lines 26-27; page 3, lines 4-6; page 27, lines 4-8; page 36, lines 8-20.
[12] The conventional gamma function for a display device is expressed as output intensity = input value^{gamma}.

gamma and gray balance, and not calibration of the display device to adjust gamma.

In some cases, a single gamma may be estimated for a display device, and used for all color channels. For better results, however, it is advisable to determine whether there may be differences in gamma among the color channels. These differences can be characterized in terms of a gray balance of the display device, as mentioned above. Although determination of individual gammas is desirable, the number of operations necessary to achieve the color characterization information is a concern. The claimed inventions reduce the number of operations necessary to determine gray balance. The resulting gray balance information can be used to correct color image values in images sent to the display device.

In accordance with the claimed invention, a gamma determination is initially made based only on the green color channel of the display device, without reference to gammas for the red and blue channels.[13] Then, the gray balance of the display device is estimated using the green gamma estimate as a starting point.[14] In particular, a first gray element having red, green and blue values is displayed by the display device.[15] The term "gray" generally refers to a color formed by combinations of two or more color channels, in contrast to colors formed by single color channels.[16]

The red, green and blue values of the first gray element are substantially equivalent to a green value determined from the initial gamma estimate.[17] Hence, the red, green and blue values are substantially equivalent to each other. To determine gray balance, the first gray element is displayed with a set of red-blue shifted gray elements.[18] Each red-blue shifted gray element has a green value that is substantially equivalent to the green value of the first gray element. However, either the red value, the blue value, or both, of each red-blue shifted gray element is different from the green value, and represents a color shift away from the first

[13] Page 2, lines 12-15; page 7, lines 14-16.
[14] Page 2, lines 14-15; page 7, lines 16-18.
[15] Page 2, lines 15-18; page 7, lines 25-29.
[16] Page 2, lines 23-26.
[17] Page 2, lines 15-18; page 3, lines 21-23.
[18] Page 2, lines 19-26, page 7, line 16, to page 8, line 6; page 36, lines 23-29.

gray element.[19] The first gray element and the red-blue shifted gray elements are displayed in conjunction with a gray background.

The user selects one of the gray elements, i.e., the first gray element or one of the red-blue shifted gray elements, that appears to most closely blend with the gray background.[20] If the user selects the first gray element, i.e., the element with equivalent red, green and blue values, then the gamma is the same for all color channels and there is no gray imbalance.[21] If the user selects one of the red-blue shifted gray elements, however, then the gamma value is not the same for all color channels and there is a gray imbalance.[22] In this case, the particular red-blue shifted gray element selected by the user indicates the direction and magnitude of the gray imbalance in light of the known red and blue color values associated with the selected gray element. According to the claimed invention, the gray balance (or imbalance) of the display device is estimated based on the user-selected gray element.

Every gray element has the same green value obtained from the initial gamma estimate. In this sense, the green value of the gray elements is "locked" for purposes of the gray balance determination.[23] However, the red and blue values are shifted to reveal differences in the gammas for each color channel, i.e., gray balance. In other words, every gray element carries the same green value, but is modulated by different gradations of red and blue.[24] This step eliminates one axis of variation, green, but permits identification of any imbalance between red and green or blue and green. This limits the range of choices to a more finely-tuned area, and aids the user in quickly and efficiently making a more accurate selection.[25] The result of the gray balance determination is a gray balance parameter or a set of individual gammas, one for each of the color channels, derived from the red, green, and blue values of the selected gray patch.

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[19] Page 36, lines 8-20; page 36, line 28, to page 38, line 14.
[20] Page 36, line 23, to page 37, line 3.
[21] Page 38, lines 1-2.
[22] Page 38, lines 2-8.
[23] Page 2, lines 10-11; page 2, line 29, to page 3, line 6; page 3, lines 12-13; page 3, lines 17-18; page 8, lines 3-6.
[24] Page 2, line 28, to page 3, line 6; page 36, lines 15-20.
[25] Id.

An initial gamma determination using only the green channel reduces the number of operations necessary to determine gamma and gray balance. Green is the most dominant and intense phosphor among red, green, and blue, and is highest in contrast.[26] Green also has the highest L* (brightness/luminance) effect in the L*a*b* color space. In addition, green most closely matches the photopic V(λ) response of the human eye.[27] The claimed inventions rely on an initial gamma determination for the green channel only. The initial gamma determination essentially ignores red and blue. In this manner, the initial gamma determination focuses on the most dominant color channel, and then applies a gray balance determination using the red-blue shifted gray elements.

In the gray balance determination, the green intensity value indicative of the initial gamma estimate is used to generate a set of gray elements that exhibit +/- (plus/minus) differences or "shifts" in red and blue away from the green value. For example, the value of green selected in the gamma estimate can be displayed in a gray patch with equal values of red and blue in the center of a range of gray elements. In some embodiments, the red-blue shift gray elements may be presented in a two-dimensional array of gray elements. The gray elements may be "patches." The gammas for red and blue can be more precisely determined by the gray balance determination, which helps identify red-blue imbalance in the display device.

The green value obtained from the initial gamma estimate may be obtained in a two-part process involving a "coarse" gamma estimate, followed by a "fine" gamma estimate.[28] In the coarse gamma estimate, a green element is selected from a broad range of green elements. In the fine gamma estimate, the selected green element is placed at the center of a narrower range of green elements.[29] The result of the "coarse" gamma estimate is used to define the narrower range used for the "fine" gamma estimate. In each case, the initial gamma estimate is "green-

[26] Page 33, lines 3-7.
[27] Id.
[28] Page 25, lines 22-25; page 33, lines 1-3; page 33, 22-26; page 34, lines 21-24; page 34, lines 26-29.
[29] Page 34, lines 28-29.

limited" in the sense that only the green color channel is used.[30] The green element selected in fine gamma estimate is then used as the green value for the green-locked gray balance determination.[31]

The green-limited gamma estimate and green-locked gray balance determination can be performed, for example, by guiding a client through a color profiling process that profiles the color response of the display device.[32] Guidance may take the form of a series of instructional web pages that are delivered to the client via the computer network.[33] For example, in order to view products with color accuracy, an Internet retailer may redirect an online customer to a color profiling server that generates instructional web pages for the customer. The web pages are interactive to enable collection of color characterization information from the client.

Once the color characterization information has been collected, a color profile can be created for the client's display device, and thereafter used for modification of color images delivered to the client.[34] With improved color image accuracy, the images viewed by the client appear as intended.[35] As a result, items ordered by online customers are less likely to be returned based on color mismatch.[36] In addition, with improved color accuracy, online customers can shop with greater confidence that the items they order will arrive in the expected color.

Claims 1-15 specify a method, in accordance with the invention, comprising displaying on a display device a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device. Accordingly, as discussed above, the first gray element has substantially equivalent red, green and blue values. The red, green and blue values are substantially equivalent to a

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[30] Page 33, lines 1-3; page 34, line 30, to page 35, line 5.
[31] Page 35, lines 10-27.
[32] Page 11, lines 1-20; page 16, lines 1-11.
[33] Id.
[34] Page 4, lines 9-13; page 11, lines 10-18; page 42, lines 3-13.
[35] Page 4, lines 12-28.
[36] Id.

selected green value, which is based on an estimated gamma for a green channel of the display device.

The method defined by claims 1-15 further comprises displaying on the display device a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value. At least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element. The gray balance of the display device is estimated based on user selection of one of the gray elements that appears to most closely blend with a gray background.

The system of claims 16-21 and 24-26 requires a web server, a color image server, and a color profile server, all of which reside on a computer network, and one or more color correction modules. The web server transmits web pages to remote clients residing on the computer network. The color image server transmits color images referenced by the web pages to the clients for display on display devices associated with the clients. The color profile server guides the clients through a color profiling process to obtain information characterizing the color responses of the display devices associated with the client. The information obtained by the color profile server includes a gray balance for each of the display devices.

The color profiling process includes applied by the color profile server of claims 16-21 and 24-26 displays on a display device a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device. In addition, the color profiling process includes displaying a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value. At least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element.

The color profiling process of claims 16-21 and 24-26 further includes selecting one of the gray values that appears to most closely blend with a gray

background, and estimating the gray balance of the display device based on the selected gray element. One or more color correction modules modify the color images transmitted by the color image server based on the information to improve the accuracy of the color images when displayed on the respective display device.

The computer-readable media of claims 27-42 comprise instructions that cause a programmable processor to perform operations similar to those set forth in method claims 1-15.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The first ground of rejection to be reviewed is the rejection of claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39 under 35 U.S.C. 102(b) as being anticipated by Elaine Weinmann and Peter Lourekas, "Photoshop 3 for Windows (Visual QuickStart Guide)," 1996 ("Weinmann").

The second ground of rejection to be reviewed is the rejection of claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42 under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe Technical Guides 1996 (Adobe).

The third ground of rejection to be reviewed is the rejection of claims 14, 25 and 40 under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe, and further in view of Berger and Brettel.

The fourth ground of rejection to be reviewed is the provisional rejection of claims 1, 5-7, 9, 11-13, 16-18, 22, 27, 29, 31-33, 35, 37, 38, 41 and 42 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6-8, 10, 12-16, 19, 21, 24, 25, 30, 31, 32, 34, 36, 37, 39 and 40 of copending U.S. application no. 09/778,515.

ARGUMENT

In the final Office Action, the Examiner rejected Claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Weinmann.

In addition, the Examiner rejected claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42 under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe, and rejected claims 14, 25, and 40 under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe, and further in view of Berger and Brettel.

Finally, the Examiner rejected claims 1, 5-7, 9, 11-13, 16-18, 22, 27, 29, 31-33, 35, 37, 38, 41 and 42 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6-8, 10, 12-16, 19, 21, 24, 25, 30, 31, 32, 34, 36, 37, 39 and 40 of copending U.S. application no. 09/778,515.

The Examiner's analysis is improper on many levels. The Examiner has failed to appreciate the basic technical differences between the claimed invention and the prior art. At the same time, the Examiner seems to be confused concerning the legal requirements to establish a prima facie case of anticipation or obviousness.

In order to support an anticipation rejection under 35 U.S.C. §102(b), it is well established that a prior art reference must disclose each and every element of a claim. This well known rule of law is commonly referred to as the "all-elements rule."[37] If a prior art reference fails to disclose any element of a claim, then rejection under 35 U.S.C. §102(b) is improper.[38] For the rejections under 35 U.S.C. §102(b) the Examiner has failed to establish a prima facie case under the "all elements rule."

In addition, the Examiner bears the burden of establishing a prima facie case of obviousness to support a rejection under 35 U.S.C. §103(a).[39] In doing so, the Examiner must determine whether the prior art provides a "teaching or suggestion to one of ordinary skill in the art to make the changes that would produce" the claimed invention.[40] A prima facie case of obviousness is established only when this burden is met.

The Court of Appeals for the Federal Circuit has addressed the evidentiary standard required to uphold an obviousness rejection.[41] Specifically, the Federal Circuit stated: "[the] factual question of motivation is material to patentability, and (can) not be resolved on subjective belief and unknown authority."[42] Deficiencies in the evidentiary record cannot be cured by general conclusions such as "general knowledge" or "common sense."[43]

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[37] *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (CAFC 1986) ("it is axiomatic that for prior art to anticipate under 102 it has to meet every element of the claimed invention").
[38] *Id. See also Lewmar Marine, Inc. v. Barient, Inc.* 827 F.2d 744, 3 USPQ2d 1766 (CAFC 1987); *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (CAFC 1990); *C.R. Bard, Inc. v. MP Systems, Inc.*, 157 F.3d 1340, 48 USPQ2d 1225 (CAFC 1998); *Oney v. Ratliff*, 182 F.3d 893, 51 USPQ2d 1697 (CAFC 1999); *Apple Computer, Inc. v. Articulate Systems, Inc.*, 234 F.3d 14, 57 USPQ2d 1057 (CAFC 2000).
[39] *In re Oetiker*, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).
[40] *In re Chu*, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995).
[41] *In re Lee*, 61 USPQ2d 1430, (CAFC 2002).
[42] *Id.* at 1434.
[43] *Id.*

Accordingly, the Examiner cannot rely on unsupported, conclusory statements to close holes in the evidentiary record.[44] A proper rejection under 35 U.S.C. § 103(a) requires that the Examiner establish, based on concrete prior art references, that it would have been obvious to a person with ordinary skill in the art to incorporate each of the features in the rejected claims at the time of the Appellant's invention. For the rejections advanced under 35 U.S.C. §103(a), the Examiner has failed to meet this burden.

Rejection under 35 U.S.C. 102(b)

The Weinmann reference fails to disclose or suggest several features required by Appellant's claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39. Therefore, Weinmann fails to support a prima facie case of anticipation under section 102(b).

The Weinmann reference is a user guide for Adobe Photoshop 3.0. Adobe Photoshop 3.0 is a software application for the creation and editing of graphic images. In the sections identified by the Examiner, Weinmann describes modification of the gamma of a display device, and selection of colors used to create or edit an image. Weinmann does not discuss estimation of the gray balance of a display device. The Examiner cited various sections in Weinmann in correspondence with the above claim limitations. The Examiner's reliance on Weinmann is misplaced.

Claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39

Claims 1-4, 6-8, 11, 13, 27-30, 32-34, 37 and 39 require:

(a) display of a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel;

(b) display of a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel,

[44] *Id.*

or a combination of the red and blue channels away from the first gray element; and

(c) estimation of a gray balance of the display device based on user selection of one of the gray elements that appears to most closely blend with a gray background.

In the section at page 256 entitled "Monitor Setup," Weinmann describes a "Calibrate" process by which the user adjusts the display device to achieve a desired gamma. In the section at page 252 entitled "General Preferences," Weinmann describes the selection of color and painting tool characteristics for use in creating or editing an image. In the section at page 122 entitled "Colorize a Grayscale Picture," Weinmann describes the selection of RGB color or CMYK color to colorize a picture.

In the section at page 15 entitled "Picker Palette," Weinmann describes the use of the Photoshop Picker palette to mix and select colors to apply with painting, editing and fill tools. In the section at page 11 entitled "Foreground and Background Colors," Weinmann describes the selection of colors using the Picker palette, addition, deletion, saving, appending and loading of colors using the Swatches palette, and mixing colors using the Scratch palette.

The Weinmann reference is virtually irrelevant to the requirements of the claimed inventions. Most of the sections identified by the Examiner relate to user selection of color characteristics for creation and editing of images, e.g., using various color palettes. The "Adjust the Gamma" section at page 256 of Weinmann describes precisely that – gamma adjustment. Weinmann makes no mention of gray balance estimation. On the contrary, Weinmann describes calibration of a display device to achieve a desired gamma. Hence, Weinmann describes adjustment of display settings to achieve a desired gamma, rather than characterization of a display device to estimate gray balance.

The Examiner's reliance on Weinmann appears to be based, at least in part, on an inability of the Examiner to recognize the difference between gamma adjustment and gray balance estimation. On the one hand, Weinmann describes calibration of a display device to achieve a desired gamma. On the other, the claimed invention requires an estimate of the gray balance of the display device,

rather than a gamma adjustment. However, this is only the first in a long list of differences. Because Weinmann is not even concerned with gray balance estimation, it also lacks any teaching that would have suggesed other features, as discussed in further detail below.

For example, Weinmann fails to disclose or suggest displaying a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device. In the Office Action, the Examiner cited page 256, Fig 9, page 122, Fig. 10, and page 252, Fig. 2, as disclosing generation of a first gray element based on an estimated gamma for a green channel of the display device. In those sections of the Weinmann reference, Appellant is unable to find any teaching that would have suggested such a feature.

At page 256, Fig. 9, as discussed above, the Weinmann reference describes steps for actively adjusting a display device by way of a monitor setup menu. In particular, the Photoshop user adjusts the overall display device gamma by actuating a slider bar (Fig. 9). Notably, it appears that the gamma slider bar initially results in a common gamma for the red, green and blue channels. Then, upon clicking the "balance button," the Photoshop user adjusts individual slider bars for the red, green and blue channels to achieve a neutral gray in the calibration squares (Fig. 9). In this manner, the user produces a desired gamma.

Hence, this portion of the Weinmann reference does not describe displaying a first gray element with red, green and blue values substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device, or a technique for estimating gray balance, as claimed. Instead, Weinmann describes a control panel in Photoshop for adjusting display characteristics to achieve a desired gamma and balance. Rather than estimating characteristics of a display device, such as gamma or gray balance, Weinmann is concerned with manipulating such a display device by making adjustments to gamma and gray balance. Nothing in this section of the Weinmann reference suggests the features set forth in the claims.

At page 122, Fig. 10, Weinmann merely describes an option by which the user can choose to display colors in RGB (red, green, blue) color mode or CMYK

(cyan, magenta, yellow, black) color mode in order to colorize a grayscale image. This portion of the Weinmann reference seems to have nothing to do with display of red, green and blue values values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device. At page 122, Weinmann appears to make no mention of gray balance estimate or display of a gray element. Instead, page 122 of Weinmann refers to tools for selection of different color modes, followed by selective adjustment of hue, saturation and lightness.

At page 252, Fig. 2, Weinmann describes the Photoshop Color Picker, which enables a user to generate customized colors. This aspect of Photoshop does not appear to relate to the requirements of Appellant's claimed invention. On page 252, Weinmann describes the manner in which the Photoshop user may selects colors, interpolation techniques, painting tool features, and other characteristics. This section of Weinmann provides no teaching relevant to the display of red, green and blue values values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device, and does not even appear to mention gamma or gray balance.

In addition to the above deficiencies, Weinmann neither discloses nor suggests displaying a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, as set forth in the amended claims. Moreover, Weinmann fails to teach estimating a gray balance of a display device based on user selection of one of the gray elements (i.e., the first gray element with substantially equivalent red, green and blue values or one of the red-blue shifted gray elements) that appears to most closely blend with a gray background, as further required by the claims.

With respect to corresponding features in the original claims, the Examiner pointed to page 15, Fig. 14, of the Weinmann reference. In that section, the Weinmann reference merely describes the use of a Picker palette "for mixing and selecting colors to apply with the painting, editing, and fill tools." Weinmann makes no mention of estimation of the gray balance of a display device at page 15.

Again, in the passages cited by the Examiner, Weinmann appears to describe techniques for picking colors to form an image, or adjusting the overall gamma or gray balance of a display device, but does not contemplate estimation of gamma or gray balance based on user selection of one of a plurality of gray elements, as particularly defined by Appellant's claims, that appears to most closely blend with a gray background. For each of the reasons advanced above, the Weinmann reference fails to disclose all of the features set forth in the claims, and therefore does not support a prima facie case of anticipation with respect to the claimed invention.

Claims 2 and 28

With respect to dependent claims 2 and 28, Weinmann does not provide a teaching that would have suggested characterization of the colorimetric response of the display device based on estimated gamma and estimated gray balance as defined in independent claims 1 and 27, respectively. The Examiner pointed to Weinmann at page 256, Fig. 9, and page 15, Fig. 14. However, those portions of the Weinmann reference are inapplicable to the requirements of the claims, for the reasons already expressed above. For example, at page 256, Fig. 9, the Weinmann reference describes active adjustment of a display device to produce a desired gamma, and makes no mention of an estimate gamma or gray balance. At page 15, Fig. 14, the Weinmann reference describes the use of a Picker palette "for mixing and selecting colors to apply with the painting, editing, and fill tools," without regard to any estimate of gamma or gray balance.

Claims 3 and 29

With respect to claims 3 and 29, Weinmann makes no mention of selection of one of a plurality of green elements displayed by a display device that appears to most closely blend with a dithered green background, and estimation of the gamma for the green channel of the display device based on the selected green element.

The Examiner pointed to Weinmann at page 256, Fig. 9, page 111, Fig. 2, and page 252, Fig. 2. In these sections, however, Weinmann provides no pertinent

teaching. For example, in each of these sections, Weinmann fails to describe any feature involving selection of one of a plurality of green elements, and does not mention a dithered green background.

At page 111, Fig. 2, Weinmann describes a feature that enables selection of a foreground or background color for formation of an image. This feature has nothing to do with estimation of gamma and does not involve presentation of green elements or use of a dithered green background. The mere mention of a "background" does not equate with a teaching of the specific requirements of claims 3 and 29.

Claims 4 and 30

With respect to claims 4 and 30, Weinmann does not disclose modifying a color image based at least in part on estimated gray balance, and delivering the modified color image to the display device. Again, there is no estimate of gray balance in the Weinmann reference. Moreover, there is no mention of modifying color images based on such an estimated gray balance. Rather than modify a color image, Weinmann modifies the actual gamma of the display device.

In support of the rejection, the Examiner pointed to page 256, Fig. 9, and page 111, Fig. 2, but did not explain the manner in which the requirements of claims 4 and 30 is disclosed in Weinmann. As discussed previously, page 256 of Weinmann refers to gamma adjustment, whereas page 11 refers to selection of foreground and background colors. There is simply no mention in Weinmann of the modification and delivery of a color image based at least in part on an estimated gray balance, particularly as Weinmann does not even discuss estimated gray balance.

Claims 6 and 32

With respect to claims 6 and 32, Weinmann makes no mention whatsoever of the estimation of a coarse gamma and a fine gamma based on selection of a first and second plurality of green elements, respectively, that appear to most closely blend with a dithered green background. The Examiner pointed to page 256, Fig.

9, of Weinmann, but provided no support for the assertion that Weinmann anticipates this feature of Appellant's claims.

In FIG. 9, Weinmann depicts slider bars for adjusting gamma and balance among the red, green and blue color channels. Yet, all of the slider bars relate to adjustment of gamma, and not estimation of gamma or gray balance. Even if estimation were contemplated, manipulation of slider bars does not correspond to selection of gray elements, as set forth in the claims. Moreover, there is no apparent basis for the Examiner's assertion that Fig. 9 shows coarse and fine gamma estimation. Indeed, Fig. 9 does not even show coarse or fine gamma adjustment, contrary to the Examiner's assertion.

Claims 7 and 33

With respect to claims 7 and 33, there is no teaching in Weinmann of the use of a first plurality of green elements that represent greater gradations in green intensity that the second plurality of green elements, for purposes of coarse and fine gamma estimation according to claims 6 and 32. The Examiner identified no corresponding features within the Weinmann reference. Instead, the Examiner stated that Fig. 9 of Weinmann "illustrates a slide bar for a plurality of green elements, which are represented lesser or greater gradation in green intensity." See page 5 of Office Action. Again, the slider bars in Fig. 9 are not used for gamma estimation, and do not include features resembling a first plurality of green elements and a second plurality of green elements.

Claims 8 and 34

With respect to claims 8 and 34, Appellant can find no teaching within Weinmann that would have suggested display of a first gray element (as defined by claims 1 and 17) in a substantially central position relative to the red-blue shifted elements (as defined by claims 1 and 17). The passage cited by the Examiner appears to be entirely devoid of such a teaching. In particular, the slider bars depicted in Fig. 9 cannot possibly be construed as presenting a first gray element in a substantially central position relative to red-blue shifted elements.

There are simply no gray or red-blue shifted elements described in Weinmann, much less the specific orientation required by claims 8 and 34.

Claims 11 and 37

With respect to claims 11 and 37, Weinmann describes adjustment of gamma, balance and blackpoint, but makes no mention of estimation of black point, gamma, and gray balance. The Examiner broadly asserted that Weinmann provides such teachings, pointing to Fig. 9 at page 256. Appellant finds nothing to support the Examiner's assertion. Again, Fig. 9 of Weinmann contains slider bars used for adjustment, and does not include any features pertinent to estimation of black point, gamma and gray balance.

Claims 13 and 39

With respect to claims 13 and 39, Appellant is unable to find any support for the notion that Weinmann describes modifying a color image based on the estimated blackpoint, gamma, and gray balance, and delivering the modified color image to the display device. The Examiner broadly asserted that the gamma adjustment features of Fig. 9 at page 256 of Weinmann correspond to such features.

Yet, there is nothing in Weinmann to suggest modification of color images based on estimated blackpoint, gamma and gray balance. The slider bars in Fig. 9 are used to adjust the color response characteristics of a display device. Weinmann makes no mention of the modification of color images displayed by the display device, based on estimated blackpoint, gamma, and gray balance. The Examiner's position is completely unsupported by the scope and content of the Weinmann reference.

Rejection Under 35 U.S.C. § 103 in view of Weinmann and Adobe

Neither Weinmann nor Adobe provides any teaching that would have suggested the desirability of modification to arrive at the inventions set forth in claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42. In support of the rejection under section 103, the Examiner essentially applied Weinmann as in the section 102

rejection above, but acknowledged that Weinmann does not describe transmitting information via a computer network, nor other network-related features of the rejected claims. However, the Examiner cited Adobe as teaching modification of Weinmann to include such features. The rejections of claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42 are improper for the reasons advanced above with respect to the deficiencies of the primary reference with respect to the independent claims. In addition, the rejections of claims 5, 12, 15-22, 24, 26, 31, 38, 41 and 42 are improper for the additional reasons set forth below.

The Adobe reference describes the Adobe Gamma control panel for calibrating and profiling a display device. Adobe describes a single gamma determination using a gray patch on a gray background, or red, green and blue gamma determination using red, green and blue patches on respective red, green and blue backgrounds. A user manipulates a slider bar to adjust the intensity of the patches relative to the backgrounds. Like Weinmann, Adobe fails to disclose or suggest the display of a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel, and display of red-blue shifted gray elements with green values substantially equivalent to the selected green value.

There is no mention in Adobe of the display of a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel. In addition, the display of red, green and blue patches in Adobe is not even remotely equivalent to the display of red-blue shifted gray elements wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element.

Claims 5 and 31

With respect to the requirements of claims 5 and 31, Weinmann does not disclose a technique, wherein a display device is associated with a client residing on a computer network, comprising transmitting information representing the estimated gray balance to a remote server on the network, modifying the color

image at the remote server based on the information, and delivering the modified color image to the client via the computer network.

As discussed with respect to the rejection under section 102, Weinmann does not even suggest estimation of gray balance, much less transmission of information representing estimated gray balance to a remote server. Moreover, Weinmann does not discuss modification of a color image based on information representing an estimated gray balance, much less performing such modification at a remote server and delivering the image to the client via the computer network.

The Examiner acknowledged that Weinmann "does not explicitly specify transmitting information via computer network," but cited Adobe as teaching "Windows NT, 95, 98, and Mac OS which could operate as clients or servers." The Examiner further surmised that the Adobe Gamma application "can be installed on a server or on a client workstation." Finally, the Examiner asserted, without evidentiary support, that the Adobe Gamma application "modifies the color image when installed, executed on the server, a workstation, or on a network." The Examiner's additional remarks concerning use of the green channel and dithered gray values seem to be misplaced, as such features are not even present in claims 5 and 31.

The Examiner's analysis is fundamentally flawed in a number of respects. First, along with the deficiencies already discussed above, Weinmann does not suggest gray balance estimation or modification of color images. Second, it is unclear how the fact that Adobe Gamma may run on different operating systems would have suggested transmission of information relating to estimated gray balance to a remote server for modification of color images. Third, there is simply no suggestion of remote transmission of estimated gray balance information in the Weinmann and Adobe references.

Fourth, it is unclear why such a modification would have been desirable in the system described by Weinmann. Fifth, Adobe also fails to provide any teaching sufficient to overcome the basic deficiencies already identified in Weinmann. For example, Adobe does not suggest modification to display a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel, along

with display of a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, as defined by claims 1 and 27.

The Examiner has pulled the alleged teachings from thin air. Neither Weinmann nor Adobe provides any teaching pertinent to transmission of information relating to estimated gray balance to a remote server for modification of color images. In view of the above deficiencies, Weinmann and Adobe fail to support a prima facie case of obviousness with respect to claims 5 and 31.

At page 5, the Examiner presented a series questions that are irrelevant to a patentability analysis. In particular, the Examiner stated that "Applicant should be describing the main factor that affecting [sic] the gray balance of the display device, for example: a program, combination of hardware and software. The response to the following question may guide Applicant: does the transmitting information via network happen simultaneously associating [sic] with the estimation of gray balance of display device?"

The basis for the Examiner's suggestions and questions is unclear. There is no authority to require that Appellant describe a so-called "main factor" affecting gray balance. Notably, the claimed invention does not play a role in adjusting or controlling the gray balance of the device. Instead, the gray balance is estimated. Once again, this seems to be a central point of confusion for the Examiner. In addition, the claims already recite sufficient features to properly define the invention as either a method (claim 5) or computer-readable medium (claim 31).

The Examiner's suggestion that the claims recite a specific program, hardware or software finds no basis in section 103 or any other legal requirement of patentability. Also, the question of whether transmission of information occurs simultaneously with gray balance estimation or not bears no relationship to the issue of obviousness. In summary, the Examiner's analysis is confused, and demonstrates a lack of understanding of the legal requirements of patentability under section 103.

Claims 12 and 38

With respect to claims 12 and 38, Weinmann fails to disclose or suggest transmitting information representing estimated blackpoint, gamma, and gray balance to a remote server on a network, modifying a color image at the remote server based on the information, and delivering the modified color image to a client via the computer network. The Examiner cited Adobe, however, as providing a teaching that would have suggested modification of the system described by Weinmann to incorporate such features.

In support of the rejection of claims 12 and 38, the Examiner used the same flawed rationale advanced with respect to claims 5 and 31. Once again, there is no suggestion in Weinmann or Adobe of the transmission information representing estimated gray balance, much less estimated gamma and blackpoint. The fact that a particular operating system is described in Adobe says nothing about the remote transmission of the type of information defined by claims 12 and 38.

Moreover, neither Weinmann nor Adobe makes any mention of a remote server that modifies a color image based on such information. The Examiner's additional remarks concerning use of the green channel and dithered gray values seem to be misplaced, as such features are not even present in claims 12 and 38.

In the final Office Action, at page 6, the Examiner further stated that the Weinmann reference discloses saving a file setting to the computer. However, this observation by the Examiner has absolutely nothing to do with the requirements of claims 12 and 38. The Examiner also stated that a "person skill [sic] in the art knows the function of a network or a server that mentioned [sic] in the Adobe and the saved files" in Weinmann.

Any logic in the Examiner's reasoning completely escapes Appellant. Understanding how a network or server works, or that settings can be saved on a computer, does not provide any teaching that would have suggested modification to transmit information representing estimated blackpoint, gamma, and gray balance to a remote server on a network, modify a color image at the remote server based on the information, and deliver the modified color image to a client via the computer network, as required by claims 12 and 38. Again, Weinmann and Adobe are directed to local adjustment of monitor settings to achieve a

desired gamma, rather than modification of color images to compensate for an estimated gamma.

With respect to claims 12 and 38, the Examiner also listed series of confusing and completely irrelevant questions. In particular, the Examiner stated "the languages that would help Applicant's claim [sic] invention to overcome the references are as follows: when (how often) does the information transmit via a network? How does the information transmit via a network? Does the information consider [sic] as a smart program/file/information transmitting via a network?"

It is unclear how the above questions relate to the issue of obviousness. It seems that the questions only obscure the proper obviousness analysis with respect to Weinmann and Adobe. The Examiner has completely side-stepped the requirements of claims 12 and 38, and appears to be confused about the actual requirements to establish a prima facie case of obviousness.

For purposes of patentability under section 103, there is no requirement that the claims set forth how information is transmitted via a network. To establish a prima facie case of obviousness, however, there is a requirement that the Examiner identify a teaching in the applied references that would have suggested the requirements of Appellant's claims. The Examiner has failed to do so.

Claims 15 and 41

With respect to claim 15 and 41, Weinmann similarly lacks a teaching that would have suggested guiding a client through the process of obtaining the estimated gray balance by delivering one or more instructional web pages to the client.

In his analysis, the Examiner relied on exactly the same rationale set forth with respect to claims 12 and 38. Unfortunately, this rationale did not even address the actual requirements of claims 15 and 41. In particular, the Examiner did not identify any teaching within Weinmann or Adobe that addresses the delivery of instructional web pages to a client. Without even addressing this limitation, it is clear that this rejection is fatally flawed. Again, the Examiner's

additional remarks concerning use of the green channel and dithered gray values seem to be misplaced, as such features are not even present in claims 15 and 41.

Claims 16-21 and 24-26

Unlike claims 16-21 and 24-26, neither Weinmann nor Adobe makes any mention of a web server residing on a computer network to transmit web pages to remote clients, a color image server residing on the computer network to transmit color images referenced by the web pages to the clients, a color profile server residing on the computer network to guide the clients through a color profiling process to obtain information characterizing the color responses of display devices associated with the clients.

Weinmann and Adobe also fail to disclose such a color profiling process including displaying a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device, displaying a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, selecting one of the gray values that appears to most closely blend with a gray background, and estimating the gray balance of the display device based on the selected gray element, as set forth in claims 16-21 and 24-26.

Finally, contrary to claims 16-21 and 24-26, Weinmann does not suggest one or more color correction modules that modify the color images transmitted by the color image server based on the information to improve the accuracy of the color images when displayed on the respective display device.

In light of the deficiencies in the Weinmann reference, the Examiner cited the Adobe reference, which describes operation of the Adobe Gamma application. Unfortunately, the Adobe reference provides no teaching sufficient to overcome the basic deficiencies in the Weinmann reference references.

For example, like Weinmann, Adobe does not describe displaying a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the

display device. The Examiner asserted that one of ordinary skill in the art would have considered it obvious "to use the green channel as the range of gray level." The Examiner provided no analysis whatsoever to support this assertion, and cited no pertinent teaching in Weinmann or Adobe. Therefore, this rejection is improper and must be reversed.

Further, neither Weinman nor Adobe makes any mention of the estimation of gray balance based on user selection of either a first gray element with substantially equivalent red, green and blue values or one of a plurality of red-blue shifted gray elements that appears to most closely blend with a gray background. Once again, the Examiner did not identify any teaching within Weinmann or Adobe that would have suggested such a feature.

In addition, the fact that the Adobe Gamma application is designed to work with different operating systems (Windows NT, 95, 98, Mac OS), as mentioned by the Examiner, falls far short of any teaching that would have suggest modification of the Photoshop application described by Weinmann to somehow include a web server, color image server, color profiling server, and color correction module.

The Adobe Gamma application would not seem to implicate the use of a web server, let alone the inclusion of a color image server that transmits color images, a color profile server that guides clients through a color profiling process to obtain information, and one or more color correction modules that modify the color images transmitted by the color image server based on the information. Again, Adobe, like Weinmann, makes no mention of remote modification of color images.

Moreover, even if such features were found in Adobe or some other prior art, it is unclear why one of ordinary skill in the art would have considered such features desirable in a document authoring application such as Adobe Photoshop. In particular, a document authoring application like Photoshop concerns the preparation of document including imagery, text and the like. This sort of application would not present a need or desire for a color image server, color profile server, or color correction module, as set forth in the claims.

Neither the Weinmann reference, nor the Adobe Gamma application provides any mention of such features. Therefore, one of ordinary skill in the art having access to Weinmann and Adobe would have obtained no concept of the additional features set forth in claims 16-21 and 24-26. Accordingly, the Adobe reference falls far short of any teaching that would have suggested the desirability of modifying the Photoshop application described by Weinmann to include the requirements of Appellant's claims.

The Examiner's rationale in support of the rejection is insufficient to support a prima facie case of obviousness. The Examiner pointed to no teaching within Weinmann or Adobe that would have suggested the features of claim 16. Instead, the Examiner merely parroted the language of claim 16 and attributed it to Fig. 9 of Weinmann, with no analysis of the correspondence of the claimed features with features in Fig. 9. As mentioned previously, Weinmann describes slider bars for adjustment of gamma, and fails to provide any teaching concerning the display of gray elements for use in estimation of gray balance.

The Examiner stated that "it would have been obvious to use the green channel as the range of gray levels" and "also dither gray values because the two different gray areas (background and center square) need to be generated in different ways for the process to work." However, this statement by the Examiner seems to be unrelated to the requirements of claim 16. For example, there is no requirement of a "dithered gray value," a "center square," or the "use of the green channel as the range of gray levels" in claim 16. Moreover, it is unclear what the Examiner means by suggesting that gray areas must be generated in different ways.

It seems the Examiner's understanding of the claimed invention and the prior art references is confused. The Examiner has failed to identify any teaching in the prior art that would have suggested the requirements of claims 16-21 and 24-26. Therefore, the rejection must be reversed.

The claims dependent on independent claim 16 incorporate all of the limitations of those base claims, and therefore are patentable for the reasons expressed above. Moreover, the Weinmann and Adobe references also fail to disclose or suggest numerous additional limitations set forth in Appellant's

dependent claims, as detailed above with respect to the 102 rejection, and as further set forth below with respect to some of the claims.

Claim 17

With respect to claim 17, for example, the Weinmann and Adobe references do not discuss transmission of information in a web cookie. The Examiner's conclusion that the mention of servers and clients in the Adobe reference somehow would have suggested the use of a web cookie in the manner claimed by Appellant is implausible. Servers and clients communicate, the majority of the time, by network protocols that do not involve exchange of web cookies. The mere mention of servers and clients in the Adobe reference would not have, in any way, suggested the use of a web cookie, nor a web cookie in the manner set forth in claim 17.

Therefore, Appellant respectfully submits that a conclusion that the mere implication of network environment would have suggested transmission of cookies as an obvious modification is misplaced. Moreover, it is unclear why network communication and, more particularly, network communication using web cookies, would have even been desirable in Weinmann and Adobe, particularly in view of the fact that there is no network communication of color response information contemplated in those references.

In the Final Office Action, the Examiner further stated that "Web cookie or HTTP cookie or [sic] just cookies can contain any arbitrary information the server chooses." Yet, the Examiner did not explain why Weinmann or Adobe would have even contemplated transmitting arbitrary information, much less the specific color response information claimed. Moreover, even if network communication were provided, the Examiner did not explain why cookies would have been the chosen vehicle in the absence of any teachings concerning delivery of web pages in Weinmann and Adobe.

The Examiner further stated that the "content and the main function of the Web cookies are important to be specified in the claim [sic] invention." There is no basis for the Examiner's statement. The function of the Web cookie, per claim 17, is that it stores color response information. It is unclear what else the

Examiner might expect and, more importantly, how his suggestion relates to patentability requirements under section 103.

Claim 18

With respect to claim 18, Weinmann makes no mention of selection of one of a plurality of green elements displayed by a display device that appears to most closely blend with a dithered green background, and estimation of the gamma for the green channel of the display device based on the selected green element.

The Examiner pointed to Weinmann at page 256, Fig. 9. In this section, however, Weinmann provides no pertinent teaching. For example, in this section, Weinmann fails to describe any feature involving selection of one of a plurality of green elements, and does not mention a dithered green background.

Claim 19 and 20

With respect to claim 19 and 20, Weinmann makes no mention whatsoever of the estimation of a coarse gamma and a fine gamma based on selection of a first and second plurality of green elements, respectively, that appear to most closely blend with a dithered green background. The Examiner pointed to page 256, Fig. 9, of Weinmann, but provided no support for the assertion that Weinmann anticipates this feature of Appellant's claims.

In FIG. 9, Weinmann depicts slider bars for adjusting gamma and balance among the red, green and blue color channels. Yet, all of the slider bars relate to adjustment of gamma, and not estimation of gamma or gray balance. Even if estimation were contemplated, manipulation of slider bars does not correspond to selection of gray elements, as set forth in the claims. Moreover, there is no apparent basis for the Examiner's assertion that Fig. 9 shows coarse and fine gamma estimation. Indeed, Fig. 9 does not even show coarse of fine gamma adjustment.

Weinmann also fails to suggest the display of a first plurality of green elements that represent greater gradations in green intensity than the second plurality of green elements, as set forth in claim 20. With respect to this

limitation, the Examiner simply pointed to Fig. 9 of Weinmann without providing any analysis.

Claim 21

With respect to claim 21, Weinmann and Adobe fail to disclose or suggest a color profiling process that includes displaying a first gray element in a substantially central position relative to the red-blue shifted elements. The Examiner characterized Adobe as illustrating, at page 5, the display of "green elements representing a range of gray levels of the green channel." Appellant can find no such teaching in the Adobe reference. Adobe describes a single gamma determination using a gray patch on a gray background, or red, green and blue gamma determination using red, green and blue patches on respective red, green and blue backgrounds. There is no mention in Adobe of the display of a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel. In addition, the display of red, green and blue patches in Adobe is not even remotely equivalent to the display of red-blue shifted gray elements wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element.

Claim 24

With respect to claim 24, neither Weinmann nor Adobe describes a color profiling process that includes estimation of black point, and including with transmitted information the estimate gamma and blackpoint. The Examiner broadly asserted that Weinmann provides such teachings, pointing to Fig. 9 at page 256. Appellant finds nothing to support the Examiner's assertion. Again, Fig. 9 of Weinmann contains slider bars used for adjustment, and does not include any features pertinent to estimation of black point.

Claim 26

Weinmann and Adobe provide no teaching that would have suggested guiding the client through the process of obtaining the estimated gray balance by delivering one or more instructional web pages to the client. In his analysis, the Examiner acknowledged that Weinmann "does not explicitly specify transmitting information via computer network," but cited Adobe as teaching "Windows NT, 95, 98, and Mac OS which could operate as clients or servers." The Examiner further surmised that the Adobe Gamma application "can be installed on a server or on a client workstation." Finally, the Examiner asserted, without support, that the Adobe Gamma application "modifies the color image when installed, executed on the server, a workstation, or on a network." There is basis for the Examiner's assertion. Adobe clearly does not disclose or suggest the delivery of web pages to guide a client through a gray balance estimation process. The mere fact that the Adobe Gamma application may be loaded on different types of computers provides no suggestion of these requirements of claim 26.

Rejection Under 35 U.S.C. § 103 in view of Weinmann, Adobe, Berger and Brettel

The Examiner rejected claims 14, 25, and 40 under 35 U.S.C. 103(a) as being unpatentable over Weinmann in view of Adobe, and further in view of Berger and Brettel. In his analysis, the Examiner essentially applied Weinmann and Adobe as applied in the rejection of claims 5, 12, 15-21, 22, 24, 26, 31, 38, 41 and 42 under section 103. The Examiner apparently recognized that the Weinmann and Adobe references fail to suggest the use of a dithered approximately 33% gray background. The Berger and Brettel reference provide no teaching sufficient to cure the basic deficiencies in Weinmann and Adobe, as already identified above, nor any teaching that would have suggested modification of the Photoshop application described by Weinmann to include these additional requirements of claims 14, 25 and 40.

Brettel describes a process for estimating the gamma of a display device. Appellant has examined the applet published on the web by Brettel, and notes that it presents a center square against a background. The user adjusts a first slider bar to apparently adjust the pixel intensity of the background. In addition, the user

adjusts a second slider bar to apparently adjust a degree of dithering in the gray patch.

The Brettel applet differs from the invention of claims 14, 25 and 40. For example, contrary to the claimed invention, the background presented by the Brettel applet is not dithered. Instead, the background in the Brettel applet appears to vary in pixel intensity on a continuous tone basis according to the position of the respective slider bar. Rather, it appears that the center square is dithered by a series of pixel lines that are selectively turned on and off, although it is difficult to confirm this point. In any event, the background in the Brettel applet clearly is not dithered.

In addition, and more importantly, the Brettel applet would have provided no suggestion to one of ordinary skill in the art of the desirability of a dithered gray background representing a fixed gray level of approximately 33%. As explained by Appellant's disclosure, a dithered background representing a fixed gray level of approximately 33% gray level, rather than, e.g., 50%, more closely matches the actual midpoint of black to gray transition for most display devices. See, e.g., page 2, line 25, to page 3, line 2. The black to gray transition ordinarily is not linear for a typical CRT monitor. With a dither that produces a fixed gray level in the range of approximately 25 to 40%, however, the gray element selected by the user in comparison to the dithered background provides a more accurate indication of gamma or gray balance.

The Berger reference provides no teaching sufficient to bridge the gap between the Brettel applet and the claimed invention. In particular, Berger does not disclose or suggest the use of a dithered background representing a gray level of approximately 33%, as required by claims 14, 25 and 40. The Examiner noted that Berger shows dithered elements with gray levels of 25%, 50% and 75% ("Gamma Demonstration Image"). However, those dithered elements clearly are not used for gamma estimation. Rather, Berger presented dithered elements with gray levels of 25%, 50% and 75% to illustrate how dithering can be used to approximate the appearance of a continuous tone element, and the effect of gamma correction on the approximation. In particular, Berger presented the

dithered elements adjacent continuous tone elements with actual intensity levels of 25%, 50% or 75% to show how dithering approximates continuous tone intensity.

For measurement of gamma, however, Berger fails to provide any teaching that would have suggested the use of a dithered background representing a gray level of approximately 33%. Berger presents an image for comparison of continuous tone gray elements to adjacent, dithered gray elements ("Gamma Measurement Image"). Appellant notes that the gray elements in the Gamma Measurement Image do not form a background.

Moreover, Berger does not suggest that the dithered gray elements should represent a gray level of approximately 33%. Indeed, Berger makes no mention of such a feature. To the contrary, the dithered gray elements presented by Berger appear to be dithered to represent a gray level of approximately 50%. In particular, in each dithered gray element, Berger appears to turn on alternating pixels, i.e., every other pixel, resulting in a 50% dither, which is directly at odds with the requirements set forth in claims 14, 25, and 40.

In the Final Office Action, the Examiner presented a list of questions that underscore his basic misunderstanding of the technical nature of the claimed invention and the prior art. The original text of the Examiner's questions is set forth below with Appellant's responses.

Examiner's Question 1: How does an estimated gamma generate a first gray element?

Appellant's Response: Gamma does not generate a first gray element. According to claim 1, a first gray element is displayed on a display device. The characteristics of the first gray element are well defined. Specifically, the first gray element has red, green and blue values that are substantially equivalent to a selected green value. The selected green value is based on an estimated gamma for a green channel of the display device. Accordingly, it is not the estimated gamma that generates the first gray element. Rather, the first gray element is generated based on an estimated gamma for the green channel.

Examiner's Question 2: What is an estimated gamma?

Appellant's Response: Those skilled in the art of color imaging understand that the term "gamma" refers to the relationship between an input value and an output value produced by a display device as a function of the input value. As is well known in the art, this relationship is not linear, and is typically described in terms of gamma, which may be expressed as an exponential term.

Examiner's Question 3: How does a set of red-blue shifted gray element generate?

Appellant's Response: The claims very clearly specify the nature of the red-blue shifted gray elements. In particular, the set of red-blue shifted gray elements have green values substantially equivalent to the selected green value. However, at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value. In this manner, each red-blue shifted gray element represents shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element.

Examiner's Question 4: Is there any special method to estimate gray balance of [sic] display based on user selection?

Appellant's Response: The literal language of claim 1 is clear with respect to the manner in which the gray balance is estimated. In particular, estimating a gray balance of the display device is based on user selection of one of the gray elements that appears to most closely blend with a gray background. Hence, by selecting the gray element that appears to most closely blend with the gray background, the user indicates the combination of red, green and blue values (that produce the color of the gray element) that most closely blend with the gray background. Relative values of red, green and blue in the selected gray element thereby indicate gray balance or imbalance, as gray balance refers to the difference in gamma between the red, green and blue color channels.

The claimed invention recognizes that estimation of a single gamma applicable to all color channels may be inappropriate due to differences, or gray imbalance, between the color channels. Gray balance indicates relative balance, or imbalance, between the different color channels so that individual gammas can be used, if necessary. Rather than estimate individual gammas directly for all color channels, however, the claimed invention provides a simplified process that relies on a green channel gamma estimate as a "starting point" for estimation of gray balance.

To that end, the first gray element includes red and blue values that are substantially equivalent to the green value. User selection of the first gray element indicates a balance among the red, green and blue color channels; hence, a common gamma for all color channels may be appropriate. The red-blue shifted gray elements have the same green value but different red and/or blue values. Therefore, user selection of one of the red-blue shifted gray elements indicates an imbalance among the red, green and blue color channels, and can be used to quantify that imbalance and yield individual gammas.

The green gamma is "locked in" in the gray balance step, while the red and blue balance or imbalance is determined. In other words, according to the claims, every gray element carries substantially the same green value, but is modulated by different gradations of red and blue. This step eliminates one axis of variation, green, but permits identification of any imbalance between red, green or blue. This simplified process limits the range of choices to a more finely-tuned area, and aids the user in quickly making a more accurate selection. Again, the result of the gray balance estimate may be a single gamma or a set of individual gammas, one for each of the color channels, derived from the red, green, and blue values of the selected gray element, depending on the result of the gray balance estimate.

Examiner's Question 5: What are the values of Gamma for CRT and LCD displays?

Appellant's Response: The Examiner's question seems to highlight his confusion. The claimed invention relates to estimation of gray balance, which is

unknown for a display device. The gamma or gray balance of a display device, such as a CRT or LCD, is not a constant, known value that applies to all display devices. Rather, differences among display devices make it necessary to estimate the gamma or gray balance in order to characterize the color response of a display device. The Examiner's question misses the point of color characterization, which is to determine the color response of a display device so that images sent to the display device can be modified to compensate for color response differences.

Examiner's Question 6: Does this invention cover only in [sic] VGA systems?

Appellant's Response: The basis for the Examiner's question is unclear. The question seems to be irrelevant to the issues of novelty and obviousness. VGA refers to a particular type of display device. There is no reason why the claimed invention would be limited to only a particular type of display device.

Examiner's Question 7: Does the gamma correction based [sic] on Voltage source?

Appellant's Response: As previously stated, those skilled in the art of color imaging understand that the term "gamma" refers to the relationship between an input value and an output value produced by a display device as a function of the input value. Again, the claimed invention does not pertinent gamma adjustment or "correction," as indicated by the Examiner. Upon the basic realization that the invention relates to gray balance estimation, and not gamma adjustment, it should be evident that the Examiner's question, and his reliance on the applied prior art references, are misdirected.

Provisional Obviousness-type Double Patenting Rejection

Claims 1, 5-7, 9, 11-13, 16-18, 22, 27, 29, 31-33, 35, 37, 38, 41 and 42 stand provisionally rejected under the judicially created doctrine of obviousness-

type double patenting as being unpatentable over claims 1, 6-8, 10, 12-16, 19, 21, 24, 25, 30, 31, 32, 34, 36, 37, 39 and 40 of copending U.S. application no. 09/778,515. Appellant respectfully submits that the Examiner has not established a prima facie case of obviousness-type double patenting. To support a provisional obviousness-type double patenting rejection, the Examiner must assess the differences between the claims in the pending applications, and indicate why the claims in one application would have been obvious over the claims in the other application. In re Berg, 46 USPQ2d 1226, 1229 (Fed Cir. 1998). The Examiner has not met this burden.

As an illustration, the Examiner recognized that claim 1 of the '515 application requires a dithered gray background representing a gray level of approximately 25-40% and acknowledged that claim 1 of the present application does not specify such a feature. In addition, the Examiner noted that claim 1 of the present application requires generation of red-blue shifted gray elements, whereas claim 1 of the '515 application does not specify such a feature.

Despite these differences, the Examiner somehow concluded that claim 1 of the pending application would have been obvious in view of claim 1 of the '515 application. In particular, the Examiner stated that the '515 application specifies a particular gray level range (25-40%), while the present application specifies a broader range (0-100%). The Examiner then stated that the present application "specifies combination of the color channels away from the gray level," and that the "meaning of both phrases is substantially equivalent to each other."

The Examiner's analysis, to the extent understood by Appellant, is in error. First, the "25-40%" limitation pertains to the dithered gray background, as set forth in claim 1 of the '515 application, and not to gray elements as set forth in claim 1 of the present application. Accordingly, the "25-40%" and "red-blue" limitations pertain to completely unrelated features of the claimed inventions. Moreover, even if the limitations did pertain to the same features, the Examiner pointed to no teaching that would have suggested to one of ordinary skill in the art the desirability of making the modifications required to achieve the claimed invention.

The Examiner applied a similar rationale in rejecting claims 16 and 27 of the present application. In view of the shortcomings noted above, Appellant respectfully requests reversal of the provisional obviousness-type double patenting rejection. The above remarks are directed to the independent claims of the present application, and should be sufficient to overcome the provisional obviousness-type double patenting rejection. In light of the provisional status of the rejection, however, Appellant defers further comment on the Examiner's analysis.

CONCLUSION

In view of Appellant's arguments, the final rejection of Appellant's claims is improper and should be reversed. Reversal of all pending rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

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APPENDIX

THE CLAIMS ON APPEAL

Claim 1 (Previously Presented): A method comprising:

displaying on a display device a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device;

displaying on the display device a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element; and

estimating a gray balance of the display device based on user selection of one of the gray elements that appears to most closely blend with a gray background.

Claim 2 (Original): The method of claim 1, further comprising characterizing the colorimetric response of the display device based on the estimated gamma and estimated gray balance.

Claim 3 (Original): The method of claim 1, further comprising:

selecting one of a plurality of green elements displayed by a display device that appears to most closely blend with a dithered green background; and

estimating the gamma for the green channel of the display device based on the selected green element.

Claim 4 (Original): The method of claim 1, the method further comprising:

modifying a color image based at least in part on the estimated gray balance; and

delivering the modified color image to the display device.

Claim 5 (Original): The method of claim 1, wherein the display device is associated with a client residing on a computer network, the method further comprising:

transmitting information representing the estimated gray balance to a remote server on the network;

modifying the color image at the remote server based on the information; and

delivering the modified color image to the client via the computer network for display on the display device.

Claim 6 (Original): The method of claim 1, further comprising determining the estimated gamma by:

selecting one of a first plurality of green elements displayed by the display device that appears to most closely blend with the dithered green background;

estimating a coarse gamma for the display device based on the selected one of the first plurality of green elements;

selecting one of a second plurality of green elements displayed by the display device that appears to most closely blend with the dithered green background, wherein the second plurality of green elements includes the selected one of the first plurality of green elements; and

estimating a fine gamma for the display device based on the selected one of the second plurality of green elements, wherein the estimated fine gamma is the estimated gamma.

Claim 7 (Original): The method of claim 6, wherein the first plurality of green elements represent greater gradations in green intensity that the second plurality of green elements.

Claim 8 (Previously Presented): The method of claim 1, further comprising displaying the first gray element in a substantially central position relative to the red-blue shifted elements.

Claim 9 (Canceled).

Claim 10 (Canceled).

Claim 11 (Original): The method of claim 1, further comprising:

estimating the blackpoint of the display device; and

characterizing the colorimetric response of the display device based on the estimated gamma, blackpoint, and gray balance.

Claim 12 (Original): The method of claim 11, wherein the display device is associated with a client residing on a computer network, the method further comprising:

transmitting information representing the estimated blackpoint, gamma, and gray balance to a remote server on the network;

modifying the color image at the remote server based on the information; and

delivering the modified color image to the client via the computer network for display on the display device.

Claim 13 (Original): The method of claim 11, further comprising:

modifying a color image based on the estimated blackpoint, gamma, and gray balance; and

delivering the modified color image to the display device.

Claim 14 (Original): The method of claim 1, wherein the gray background is a dithered approximately 33% gray background.

Claim 15 (Original): The method of claim 1, wherein the display device is associated with a client on a computer network, the method further comprising guiding the client through the process of obtaining the estimated gray balance by delivering one or more instructional web pages to the client.

Claim 16 (Previously Presented): A system comprising:

a web server residing on a computer network, the web server transmitting web pages to remote clients residing on the computer network;

a color image server residing on the computer network, the color image server transmitting color images referenced by the web pages to the clients for display on display devices associated with the clients; and

a color profile server residing on the computer network, the color profile server guiding the clients through a color profiling process to obtain information characterizing the color responses of the display devices associated with the clients, wherein the information includes a gray balance for each of the display devices, and the color profiling process includes:

displaying on a display device a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device;

displaying on the display device a set of red-blue shifted gray elements with green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element; and

selecting one of the gray values that appears to most closely blend with a gray background, and

estimating the gray balance of the display device based on the selected gray element; and

one or more color correction modules that modify the color images transmitted by the color image server based on the information to improve the accuracy of the color images when displayed on the respective display device.

Claim 17 (Original): The system of claim 16, wherein the color image server stores the information to the client in a web cookie, the client transmits the web cookie from the client to the server, and the color image server modifies the color image via the server based on the contents of the web cookie.

Claim 18 (Original): The system of claim 16, wherein the color profiling process includes:

selecting one of a plurality of green elements displayed by a display device that appears to most closely blend with a dithered green background; and

estimating the gamma for the green channel of the display device based on the selected green element.

Claim 19 (Original): The system of claim 16, wherein the color profiling process includes determining the estimated gamma by:

selecting one of a first plurality of green elements displayed by the display device that appears to most closely blend with the dithered green background;

estimating a coarse gamma for the display device based on the selected one of the first plurality of green elements;

selecting one of a second plurality of green elements displayed by the display device that appears to most closely blend with the dithered green

background, wherein the second plurality of green elements includes the selected one of the first plurality of green elements; and

estimating a fine gamma for the display device based on the selected one of the second plurality of green elements, wherein the estimated fine gamma is the estimated gamma.

Claim 20 (Original): The system of claim 19, wherein the first plurality of green elements represents greater gradations in green intensity that the second plurality of green elements.

Claim 21 (Previously Presented): The system of claim 16, wherein the color profiling process includes displaying the first gray element in a substantially central position relative to the red-blue shifted elements.

Claim 22 (Canceled):

Claim 23 (Canceled):

Claim 24 (Original): The system of claim 16, wherein the color profiling process includes:

estimating the blackpoint of the display device; and

including with the information the estimated gamma and estimated blackpoint.

Claim 25 (Original): The system of claim 16, wherein the gray background is a dithered approximately 33% gray background.

Claim 26 (Previously Presented): The system of claim 16, wherein the display device is associated with a client on a computer network, the method further comprising guiding the client through the process of obtaining the estimated gray balance by delivering one or more instructional web pages to the client.

Claim 27 (Previously Presented): A computer readable medium comprising instructions that cause a programmable processor to:

display on a display device a first gray element having red, green and blue values that are substantially equivalent to a selected green value based on an estimated gamma for a green channel of the display device;

display on the displace device a set of red-blue shifted gray elements with green green values substantially equivalent to the selected green value, wherein at least one of the red and blue values of each of the red-blue shifted gray elements is different from the selected green value, and thereby represent shifts in the red channel, blue channel, or a combination of the red and blue channels away from the first gray element; and

generate a gray balance of the display device based on user selection of one of the gray elements that appears to most closely blend with a gray background.

Claim 28 (Original): The computer readable medium of claim 27, wherein the instructions cause the processor to characterize the colorimetric response of the display device based on the estimated gamma and estimated gray balance.

Claim 29 (Original): The computer readable medium of claim 27, wherein the instructions cause the processor to:

select one of a plurality of green elements displayed by a display device that appears to most closely blend with a dithered green background; and

estimate the gamma for the green channel of the display device based on the selected green element.

Claim 30 (Original): The computer readable medium of claim 27, wherein the instructions cause the processor to:

modify a color image based at least in part on the estimated gray balance; and

deliver the modified color image to the display device.

Claim 31 (Original): The computer readable medium of claim 27, wherein the display device is associated with a client residing on a computer network, and the instructions cause the processor to:

transmit information representing the estimated gray balance to a remote server on the network;

modify the color image at the remote server based on the information; and

deliver the modified color image to the client via the computer network for display on the display device.

Claim 32 (Original): The computer readable medium of claim 27, wherein the instructions cause the processor to determine the estimated gamma by:

selecting one of a first plurality of green elements displayed by the display device that appears to most closely blend with the dithered green background;

estimating a coarse gamma for the display device based on the selected one of the first plurality of green elements;

selecting one of a second plurality of green elements displayed by the display device that appears to most closely blend with the dithered green background, wherein the second plurality of green elements includes the selected one of the first plurality of green elements; and

estimating a fine gamma for the display device based on the selected one of the second plurality of green elements, wherein the estimated fine gamma is the estimated gamma.

Claim 33 (Original): The computer readable medium of claim 32, wherein the first plurality of green elements represent greater gradations in green intensity that the second plurality of green elements.

Claim 34 (Previously Presented): The computer readable medium of claim 27, wherein the instructions cause the processor to display the first gray element in a substantially central position relative to the red-blue shifted elements.

Claim 35 (Canceled).

Claim 36 (Canceled).

Claim 37 (Original): The computer readable medium of claim 27, wherein the instructions cause the processor to:

estimate the blackpoint of the display device; and

characterize the colorimetric response of the display device based on the estimated gamma, blackpoint, and gray balance.

Claim 38 (Original): The computer readable medium of claim 37, wherein the display device is associated with a client residing on a computer network, and the instructions cause the processor to:

transmit information representing the estimated blackpoint, gamma, and gray balance to a remote server on the network;

modify the color image at the remote server based on the information; and

deliver the modified color image to the client via the computer network for display on the display device.

Claim 39 (Original): The computer readable medium of claim 37, wherein the instructions cause the processor to:

modify a color image based on the estimated blackpoint, gamma, and gray balance; and

deliver the modified color image to the display device.

Claim 40 (Original): The computer readable medium of claim 27, wherein the gray background is a dithered approximately 33% gray background.

Claim 41 (Original): The computer readable medium of claim 27, wherein the display device is associated with a client on a computer network, and the instructions cause the processor to guide the client through the process of obtaining the estimated gray balance by delivering one or more instructional web pages to the client.

Claim 42 (Original): The computer readable medium of claim 27, wherein the instructions are contained both in physical data storage media and signals transmitted between the client and other resources on the computer network.